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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,948	09/29/2003	Koji Hasegawa	0171-1023P	8310

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EXAMINER

LEE, SIN J

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 03/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/671,948

Applicant(s)

HASEGAWA ET AL.

Examiner

Sin J. Lee

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2 and 9-12 is/are allowed.
- 6) ☒ Claim(s) 1, 3-8 and 13-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

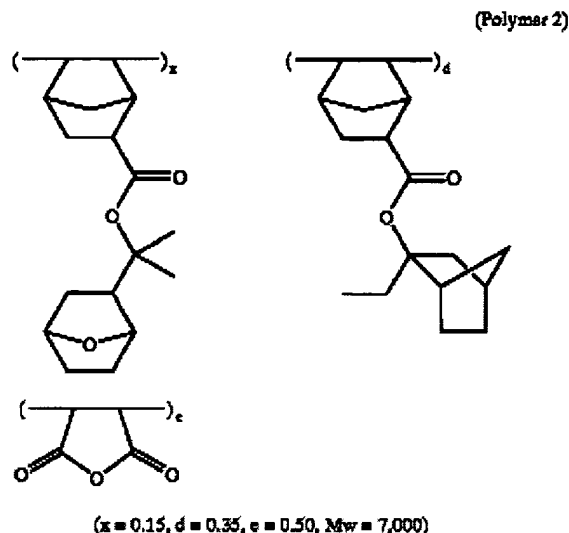
1. Due to the amendment of November 30, 2004, previous 102(e) rejection on claims 1 and 3-8 over Nishi et al'101 is hereby withdrawn.
2. Due to newly cited prior arts, the following rejections are made *non-final*.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 18-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Nishi et al (US 6,677,101 B2)

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Nishi's Polymer 2, which is shown in col.52, lines 1-20, has the following structure;



The monomer that forms the first repeat unit of the polymer shown above teaches present ester compound of claim 18 (see the 7th compound from the end of the claim). Therefore, the prior art teaches present inventions of claims 18-20. In Example I-2 (see Table 1), Nishi teaches a resist composition containing the polymer shown above. After spin-coating the resist composition onto a silicon wafer and heat-treating at 110°C for 90 seconds, Nishi expose the silicon wafer to KrF excimer laser stepper, heat-treat at 110°C for 90 seconds, and then develops for 60 seconds to form a resist pattern (see col.55, lines 55-67, col.56, lines 48-62). Therefore, Nishi teaches present inventions of claims 21 and 22.

Claim Rejections - 35 USC § 103

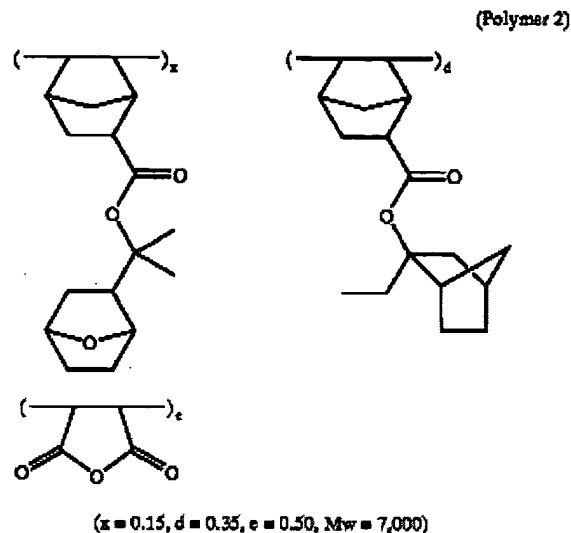
5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1 and 3-8 are rejected under 35 U.S.C. 103(a) as being obvious over Nishi et al (US 6,677,101 B2) in view of Hasegawa et al (US 6,774,258 B2).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Nishi's Polymer 2, which is shown in col.52, lines 1-20, has the following structure;



In Example I-2 (see Table 1), Nishi teaches a resist composition containing the polymer shown above. After spin-coating the resist composition onto a silicon wafer and heat-treating at 110°C for 90 seconds, Nishi expose the silicon wafer to KrF excimer laser stepper, heat-treat at 110°C for 90 seconds, and then develops for 60 seconds to form a resist pattern (see col.55, lines 55-67, col.56, lines 48-62).

In the first repeat unit shown above, the $-\text{C}(=\text{O})\text{O}-\text{C}(\text{CH}_3)_2-$ moiety is represented by the variable "W" in Nishi's generic formula (1-1) (see col.2, lines 49-67, col.4, lines 21-25). Nishi defines "W" as a straight-chain or branched divalent hydrocarbon radical having 2 to 10 carbon atoms, which may have one or more ester linkages in its structure (see col.4, lines 21-25). The moiety of $-\text{C}(=\text{O})\text{O}-\text{C}(\text{CH}_3)_2-$ in the first repeat unit shown above is a *branched* divalent hydrocarbon radical having 3 carbon atoms which has one ester linkage in its structure. Based on the reading of Nishi's definition of "W", it is the Examiner's position that it would have been obvious to one of ordinary skill in the art to substitute $-\text{C}(=\text{O})\text{O}-\text{C}(\text{CH}_3)(\text{CH}_2\text{CH}_3)-$ (which is a branched divalent hydrocarbon

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radical having 4 carbon atoms which has one ester linkage in its structure) for $-C(=O)O-C(CH_3)_2-$ because both of the moieties are within the definition of "W" given by Nishi.

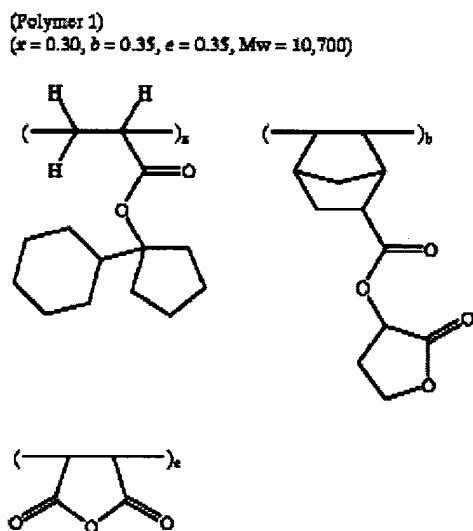
Besides, a methyl group and an ethyl group are art-known, chemically equivalent functional groups as evidenced by Hasegawa et al, col.3, lines 1-24. Therefore, based on the teachings of Nishi in view of Hasegawa, it is the Examiner's position that it would have been obvious to one of ordinary skill in the art to substitute $-C(=O)O-C(CH_3)(CH_2CH_3)-$ for $-C(=O)O-C(CH_3)_2-$ in the first repeat unit of the polymer shown above with a reasonable expectation of obtaining a resist material which not only exhibits excellent properties such as sensitivity, resolving power and etching resistance, but also undergoes a well-controlled degree of swelling. Therefore, Nishi in view of Hasegawa would render obvious present inventions of claims 1 and 3-8.

7. Claims 1, 4, and 13-23 are rejected under 35 U.S.C. 103(a) as being obvious over Hasegawa et al (US 6,586,157 B2) in view of Chiba et al (US 6,280,900 B1).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and

reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Hasegawa teaches the following polymer (Polymer 1) in col.40, lines 25-45:



Hasegawa teaches a resist composition containing Polymer 1 and a photoacid generator in Example 1 (see Table 1). Hasegawa spin-coats his resist composition solution onto a silicon wafer and then bakes the coated resist composition solution to give a resist film. The resist film is exposed using ArF laser and then baked and puddle developed to give a resist pattern (see col.46, lines 52-59).

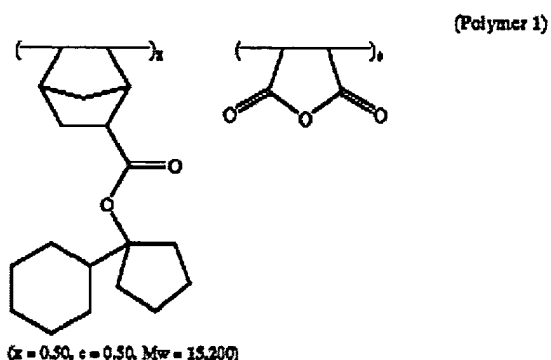
The first repeat unit of the polymer shown above does not include present furandiyl, tetrahydrofurandiyl or oxanorbornanediyl group. However, it is well known in the art that the cyclopentyl group shown in the first repeat unit of the above polymer and a tetrahydrofuranyl group are equivalent cyclic acid-decomposable groups as evidenced by Chiba et al, col.15, lines 26-31. Because the cyclopentyl group and a tetrahydrofuranyl group were art-recognized equivalents at the time the invention was made, it would have been obvious to one of ordinary skill in the art to substitute the tetrahydrofuranyl group for the cyclopentyl group in the first repeat unit of Hasegawa's polymer shown above. Such polymer teaches present polymer which is made from the present ester compound of formula (1) (specifically, the 28th ester compound shown in present claim 18). Therefore, Hasegawa in view of Chiba would render obvious present inventions of claims 1, 4, and 13-23.

8. Claims 1, 4-8, and 18-23 are rejected under 35 U.S.C. 103(a) as being obvious over Hasegawa et al (US 6,596,463 B2) in view of Chiba et al (US 6,280,900 B1).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR

1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Hasegawa teaches the following polymer (Polymer 1) in col.46, lines 1-15:



Hasegawa teaches a resist composition containing Polymer 1 and a photoacid generator in Example I-1 (see Table 1). Hasegawa spin-coats his resist composition solution onto a silicon wafer and then bakes the coated resist composition solution to give a resist film. The resist film is exposed using KrF laser and then baked and developed to give a positive resist pattern (see col.52, lines 25-32).

The first repeat unit of the polymer shown above does not include present furandiyl, tetrahydrofurandiyl or oxanorbornanediyl group. However, it is well known in the art that the cyclopentyl group shown in the first repeat unit of the above polymer and

a tetrahydrofuranyl group are equivalent cyclic acid-decomposable groups as evidenced by Chiba et al, col.15, lines 26-31. Because the cyclopentyl group and a tetrahydrofuranyl group were art-recognized equivalents at the time the invention was made, it would have been obvious to one of ordinary skill in the art to substitute the tetrahydrofuranyl group for the cyclopentyl group in the first repeat unit of Hasegawa's polymer shown above. Such polymer teaches present polymer which is made from the present ester compound of formula (1) (specifically, the 16th ester compound shown *from the end of present claim 18*). Therefore, Hasegawa in view of Chiba would render obvious present inventions of claims 1, 4-8, and 18-23.

Allowable Subject Matter

9. Claims 2 and 9-12 are allowed. None of the cited prior arts teaches or suggests present ester compound of claim 2.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

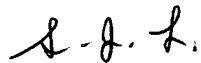
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Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

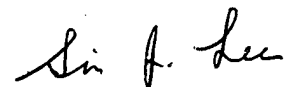
you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).



S. Lee

March 20, 2005



Sin J. Lee
Patent Examiner
Technology Center 1700